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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,307	09/29/2006	Hiroyuki Nagasaka	128253	3653

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P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER

MATHEWS, ALAN A

ART UNIT	PAPER NUMBER
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2882

NOTIFICATION DATE	DELIVERY MODE
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08/27/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com
jarmstrong@oliff.com

Office Action Summary	Application No. 10/581,307	Applicant(s) NAGASAKA ET AL.	
	Examiner ALAN A. MATHEWS	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 12-41 and 60-98 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 12-18, 22, 24, 30, 34-40, 72-80, 85-93, 97 and 98 is/are rejected.
- 7) ☒ Claim(s) 6, 19-21, 23, 25-29, 31-33, 41, 60-71, 81-84 and 94-96 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/22/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of a **verified English translation** of Applicants' priority application JP 2003-404384 (filed December 3, 2003) to perfect his priority with respect to that application.

Withdrawal of Indicated Allowability of Claims

2. The indicated allowability of claims 5, 17, 18, and 22 are withdrawn in view of further analysis of different embodiments of the references that were not used in the previous office action. This office action includes a new, non-final rejection. The Examiner apologizes for any inconvenience to the Applicant caused by this withdrawal of allowability.

Claim Objections

3. Claims 80, 92, and 93 are objected to because of the following informalities: In claim 80, line 4, there is no proper antecedent basis for "**the reference member**". In claim 92, line 2, there is no proper antecedent basis for "**the reference member**". In

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claim 93, line 4, there is no proper antecedent basis for **"the reference member"**.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. Claims 1 – 5, 7, 12 - 18, 22, 24, 30, 34 – 40, 97, and 98 are rejected under 35 U.S.C. 102(e) as being anticipated by Loft et al. '582. Lof et al.'582 discloses in paragraphs # 0102 - # 0109 and figures 1 and 2 an exposure apparatus that exposes a substrate W through a liquid 11. Projection optical system PL projects an image of a pattern onto the substrate W. Substrate table WT holds the substrate W. Paragraph # 0115 discloses that an **edge seal member 17** may form an integral part of the substrate table WT (as illustrated in FIG4 as edge seal member 117) or **may be temporarily mounted relative to the remainder of the substrate table by the use of for example, vacuum suction or through use of electromagnetic forces**. In other words, edge seal member 17 could be **exchangeably** mounted to the substrate table WT. Paragraph # 0155 further discloses that edge seal member 17 is moveable relative to the remainder of the substrate table. Paragraph # 0136 discloses an embodiment with an edge seal member 117 which is an integral part of the substrate table WT. **However, this embodiment is equally applicable to an edge seal member 17 which is movable relative to the substrate table WT.** **Remember from above that edge seal 17 may be temporarily mounted to the substrate table.** Paragraph # 0137 discloses that edge seal member 500 is affixed to the edge seal member 117.

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Paragraph # 0148 discloses that edge seal member **500** may be fashioned from flexible material such as **Teflon**. Teflon is **hydrophobic** or liquid-repellent as recited in paragraph # 0157. It follows that if edge seal 500 (which is liquid-repellent) is affixed to edge seal 117 (or affixed to edge seal 17, since this embodiment is equally applicable to edge seal 17), and edge seal 17 is temporarily mounted to the remainder of the substrate table (i.e. is exchangeably mounted to the substrate table), **then element 17 with edge seal 500 could be considered a member which is liquid-repellent and is provided exchangeably on the substrate table.** Thus, the above explanation discloses that Lof et al.'582 at least reads on independent claims 1, 12, and 97. With respect to claims 2 and 38, the edge seal 500 would be exchanged upon deterioration of its properties, which would include a deterioration of liquid repellence. It is further noted that the statement "member is exchanged depending on deterioration of liquid repellence thereof" is a functional statement and is not a structural limitation in the apparatus claim 2. With respect to claim 3, paragraph # 0140 discloses that the further edge seal member 500 may provided attached to or near the top surface of the edge seal member 117 (or alternatively edge seal member 17). Furthermore, paragraph # 0113 discloses an edge seal member 17 has a surface co-planar with the upper primary surface of substrate W. With respect to claim 4, paragraph # 0116 discloses edge seal elements that surround the substrate. With respect to claims 5, 16, and 36, paragraph # 0114 discloses that seal member 17 could be temporarily mounted relative to the substrate table by the use of vacuum suction or through use of electromagnetic forces. With respect to claim 7, paragraph # 0148 discloses that further edge seal member 500

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is made of Teflon (which is a polytetrafluoroethylene). With respect to claim 13, sensor 220 in figure 17 is considered to be a measuring stage. With respect to claims 14 and 40, paragraph # 0010 discloses multiple stages or dual stages. With respect to claims 17 and 18, in another embodiment disclosed in figure 10 and paragraphs # 0149 - # 0153, the seal member 50 is made of liquid resistant material such as PTFE (which is polytetrafluoroethylene or Teflon, and is hydrophobic). Seal 50 in figure 10 is stepped member having a first surface which is opposed to a back surface of the substrate and a second surface which extends to outside of the substrate along a surface of the substrate.

With respect to Applicant's arguments, concerning Lof et al.'582, it is noted that Applicant is applying a different embodiment of Lof et al.'582 than in the previous office action. Therefore, Applicant's arguments do not apply to the new rejection.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 12-16, 30, 36 – 40, 72-80, 85 - 93, 97, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lof et al. '582 in view of Kurt et al. (U.S. Patent No. 6,882,406). Lof et al.'582 discloses in paragraphs # 0102 - # 0109 and

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figures 1 and 2 an exposure apparatus that exposes a substrate W through a liquid 11.

Projection optical system PL projects an image of a pattern onto the substrate W.

Substrate table WT holds the substrate W. Figure 17 and paragraphs # 0173, # 0174, and # 0175 disclose a **member (intermediate plate) 210** that is provided on the substrate table and is **removable** (exchangeable –see paragraph # 0175). Removable member 210 could be exchanged upon deterioration of the optical properties of member 210. The removable member 210 helps with the **image sensor 220**. With respect to claims 2, 15, and 38, the removable member 210 could be removed upon deterioration of its optical properties. With respect to claim 13, the portion of the stage holding the image sensor 220 could be considered a measuring stage and the portion that holds the substrate could be considered the substrate stage. With respect to claim 14, paragraph # 0010 discloses a plurality of stages. With respect to claims 16 and 36, paragraph # 0173 discloses holding plate 210 by vacuum sources. With respect to claims 80, 92, and 93, there is no antecedent basis for "**the reference member**". Therefore, the Examiner is interpreting the claim as not reciting a "reference member". With respect to claims 87 - 90, the sensors claimed are well-known sensors. Thus, Lof et al.'582 discloses the invention except for specifically disclosing that the member (intermediate plate) 210 is liquid repellent. Kurt et al. discloses a projection system that could be a **refractive optics** system or a **transmissive type apparatus** (see column 3, lines 20 – 22, column 4, line 34, and column 7, lines 36-38). Kurt et al. discloses in figures 1 and 2 and column 4, lines 1-19, and column 6, lines 8-13, an exposure apparatus and method wherein an optical element has, on its surface, a **hydrophobic (water-**

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repellent) layer. The optical element could be any optical element involved in directing, focusing, shaping, controlling the projection beam. The optical element may also be a sensor such as an image sensor or a spot sensor. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the removable intermediate plate 210 of Lof et al.'582 with a hydrophobic layer (water-repellent layer) in view of Kurt et al. for the purpose of better control of the liquid and to prevent oxidation. Alternatively, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the image sensor 220 in Lof et al.'582, itself, with a hydrophobic (liquid-repellent) layer in view of Kurt et al. for the purpose of better control of the liquid and prevention of oxidation.

With respect to Applicant's arguments concerning Kurt and Lof et al.'582, Applicant argues that Kurt discloses an EUV lithography apparatus, and that EUV exposure systems are adversely affected by liquids and do not operate in a liquid immersion environment. Therefore, combining Lof et al.'582 and Kurt et al. would destroy the invention of Kurt. On the contrary, Kurt et al. is very specific about stating in column 3, lines 20-22, and column 7, lines 36-38, that his apparatus **also applies to refractive optics and transmissive type lithographic apparatus**. Therefore, combining Lof et al.'582 and Kurt et al. would not destroy the invention of Kurt et al. Furthermore, the Examiner is combining Lof et al.'582 and Kurt et al. in a different manner than in the previous office action.

Allowable Subject Matter

7. Claims 6, 19-21, 23, 25-29, 31-33, 41, 60-71, 81-84, and 94-96 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reasons for the indicated allowability of the claims are as follows:

The prior art does not disclose or suggest wherein the attaching/detaching mechanism is capable of detaching the member from the substrate table together with the substrate in combination with all the other elements recited in **all** the parent claims to dependent claim 6.

The prior art does not disclose or suggest further comprising an outer member which has a third surface extending to outside of the liquid-repellent member along the surface of the substrate and which is engageable with the liquid-repellent member, wherein at least the third surface is liquid-repellent in combination with all the other elements recited in **all** of the parent claims to dependent claim 19.

The prior art does not disclose or suggest further comprising a substrate table on which a substrate holder is placed, wherein the substrate holder and the substrate table have flow passages to make communication with each other

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respectively in combination with all the other elements recited in **all** of the parent claims to dependent claim 23.

The prior art does not disclose or suggest wherein the liquid-repellent member includes at least a part of a reference member and a part an optical sensor in combination with all the other elements recited in **all** of the parent claims to dependent claim 25.

The prior art does not disclose or suggest wherein the part of the liquid-repellent member, which is liquid-repellent, has a light irradiated surface; and adhesive layer is formed on the light irradiated surface; and an amorphous fluororesin layer is formed on a surface of the adhesive layer in combination with all the other elements recited in **all** of the parent claims to dependent claim 27.

The prior art does not disclose or suggest wherein an exchanging timing for the member is determined on the basis of decrease in contact angle of the liquid at the liquid-repellent part of the member in combination with all the other elements recited in all of the parent claims to dependent claim 31.

The prior art does not disclose or suggest wherein the deterioration of the liquid repellence is judged depending on a totalized amount of radiation of ultraviolet

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light in combination with all the other steps recited in the parent claim to dependent claim 41.

The prior art does not disclose or suggest wherein the member includes a reference member having an irradiated surface, at least a part of which is liquid-repellent in combination with all the other elements recited in the parent claim to dependent claim 60.

The prior art does not disclose or suggest wherein the liquid-repellent member includes a reference member having an irradiated surface, at least a part of which is liquid-repellent in combination with all the other elements recited in the parent claim to dependent claim 81.

The prior art does not disclose or suggest wherein an exchange timing for the liquid-repellent part is determined on the basis of a decrease in contact angle of the liquid at the liquid repellent part in combination with all the other steps recited in the parent claim to dependent claim 94.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents cited in the PTO-1449 are cited for the same reasons they were cited in Applicant's IDs. The patent to Ward (U. S. Patent Application Publication No. 2005/0000941) is cited to show in paragraph # 0024 that **Teflon and PTFE and polytetrafluoroethylene are the same thing.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN A. MATHEWS whose telephone number is (571)272-2123. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alan A. Mathews/
Primary Examiner
Art Unit 2882

AM